Index to the genera—Continued.

Genera.	Corresponding numbers of first species.
Pyrocephalus	340
Q.	
Querquedula	667
Querula	361
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Ramphocelus	128
Ramphocænus	258
Regerhinus	531
Rhodinocichla	22
Rhyacophilus	616
Rhynchops	689
Rhynchocyclus	300
Rostrhamus	535
Rupornis	552
S.	
Saltator	158
Sayornis	275
Sclerurus	240
Seiurus	59
Selasphorus	427
Selenidera	469
Serpophaga	337
Setophaga	76
Sittasomus	223
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Strix	502
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Spiziastur	541
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Stenopsis	394
Sterna	684
Sturnella	204
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Sylvania	68
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Tachycineta	83
Tachyphonus	142
Tanagra	126
Tantalus	633
Tetragonops	472
Thalurania	423
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Thamnistes	250
Thrasaetus	544
Thryophilus	29
Thryothorus	36
Tigrisoma	646
Tinamus	596
Tityra	341
Todirostrum	280
Totanus	614
Tryngites	627
Trochilus	426
Troglodytes	40
Trogon	382
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Tyranniscus	290
Tyrannulus	289
Tyrannus	331
U.	
Urospatha	366
Urubitinga	546
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X.	
Xenops	221
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Zenaidura	585
Zonotrichia	177

IDENTIFICATION OF THE SPECIES OF CYPRINIDÆ AND CATOSTOMIDÆ, DESCRIBED BY DR. CHARLES GIRARD, IN THE PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA FOR 1856.

By **DAVID S. JORDAN.**

In the years from 1851 to 1855 large collections of fresh-water fishes were made in the western parts of the United States by naturalists attached to the United States and Mexican Boundary Commission and to the Pacific Railroad Survey.

The new species in these collections were described by Dr. Charles Girard in different papers in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1853 to 1859, and again in the report of the United States and Mexican Boundary Survey and the United States and Pacific Railroad Explorations, Vol. X, both works being issued in 1859.

The *Cyprinidæ* and *Catostomidæ* included in these collections were nearly all described for the first time in a paper entitled "Researches upon the Cyprinoid fishes inhabiting the fresh waters of the United States west of the Mississippi Valley, from specimens in the museum of the Smithsonian Institution." This was published in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1856, pages 154–208.

Girard's descriptions of these difficult fishes are very far from good. The characters noted are usually superficial ones, and real specific distinctions, such as differences in the numbers of the scales of the lateral line, are generally overlooked.

After Dr. Girard's connection with the Smithsonian Institution had closed many of his labels became obliterated; some of his types were lost or destroyed, and a certain identification of many of his species could not be made. A careful examination of the material studied by him, including many bottles from which the labels have been lost, has enabled the writer to positively identify very many of his types not hitherto recognized. There is also a series of many of Girard's types in the possession of the Academy of Philadelphia, these having been presented many years ago by the Smithsonian Institution. These types have been studied by Mr. Seth E. Meek, and many of them by the writer also.

The present paper contains a list of Girard's species, arranged in the order given by him, and opposite each my identification of it. Those species of which the types are still in the National Museum are indicated by a star (*); those which are found at present only in the Academy of Sciences by a dagger (†). A number of synonymic notes are added. A few notes taken from manuscripts of Mr. Meek, and not verified by me, are credited to him.

Name.	Identification.
* Mylocheilus fraterculus	Mylochilus caurinus, (Rich.).
* Mylopharodon conocephalus, (B. & G.)	Mylopharodon conocephalus, (B. & G.).
* Carpiodes damalis	Ictiobus velifer bison, (Ag.).
* Ictiobus tumidus, (B. & G.)	Ictiobus velifer tumidus, (B. & G.).
* Moxostoma claviformis[1]	Erimyzon sucetta oblongus, (Mitch.).
* Moxostoma kennerlii	Erimyzon sucetta, (Lac.).
Moxostoma victoriæ	Minytrema melanops, (Raf.).
Moxostoma campbelli	Erimyzon sucetta, (Lac.).
* Ptychostomus congestus, (B. & G.)	Moxostoma congestum, (B. & G.).

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[1] This is the ordinary northern *Erimyzon*, described in Jordan & Gilbert's Synopsis, p. 133, as *Erimyzon sucetta*. The two forms of *Erimyzon* seem to grade into each other. South Carolina examples belong to the southern type, which is, therefore, in all probability, the real *Cyprinus sucetta* of Lacépède. The northern form (*sucetta* of the Synopsis) may stand as *Erimyzon sucetta oblongus*, and the southern form (*E. goodei* of the Synopsis) as *Erimyzon sucetta*. The southern form ranges from South Carolina to Texas, and the type of *M. kennerlii* belongs to it.

Name.	Identification.
* Ptychostomus albidus[1]	Moxostoma congestum, (B. & G.).
Ptychostomus haydeni	? Moxostoma macrolepidotum, (Le. S.).
* Minomus insignis, (B. & G.)[2]	Catostomus insignis, (B. & G.).
* Minomus plebeius, (B. & G.)[3]	Pantosteus plebins, (B & G.).
* Minomus clarki, (B. & G.)[4]	Catostomus clarki, (B. & G.).
* Acomus latipinnis, (B. & G.)	Catostomus latipinnis, (B. & G.).
* Acomus guzmaniensis[5]	Pantosteus guzmaniensis, (Grd.).
Acomus generosus[6]	Pantosteus generosus, (Grd.).
* Acomus griseus	Catostomus catostomus, (Forster).
Acomus lactarius	Catostomus catostomus, (Forster).
* Catostomus macrocheilus	Catostomus macrocheilus, (Grd.).
Catostomus sucklii	Catostomus teres, (Mitch.).
* Catostomus bernardini[7]	Catostomus bernardini, (Grd.).
* Campostoma ornatum[8]	Campostoma ornatum, (Grd.).
* Campostoma formosulum[9]	Campostoma formosulum, (Grd.).
* Campostoma nasutum[10]	Campostoma anomalum, (Raf.).

[1] The type of *Ptychostomus albidus* is a young individual of *M. congestum*. The scales are of the usual size in this genus, about 45 in the lateral line instead of 56 as shown in Girard's figure. *Moxostoma congestum* is very common in Texas, and seems to be quite distinct from *M. macrolepidotum*.

[2] *Catostomus insignis* is a valid species, nearer *C. teres* than *C. clarki*, but having a broader upper lip than the former. Its scales are considerably crowded anteriorly, much more so than in *C. clarki*, though less so than in *C. teres;* about 27 scales before dorsal. Lat. l. 56. D. 10. Lips broad, the upper with many series of tubercles; lower without cartilaginous sheath; fontanelle small. This is the *Catostomus insigne* of Cope & Yarrow.

[3] The type of *Catostomus plebeius* is a *Pantosteus*, allied to *P. generosus*, but with the scales before the dorsal larger. Scales crowded forwards; upper lip full, with 2 or 3 rows of tubercles; lower with 5. Jaws with cartilaginous sheaths. Snout broad, moderately projecting. Fins much lower than in *P. guzmaniensis*. D. 9. Lat. l. 90; 29 to 30 in cross series. Head 4$\frac{3}{5}$ in length; depth 5. Ventral fins rather short. I do not see that the descriptions of *Pantosteus delphinus* and *P. bardus* indicate any differences from *P. plebeius*.

[4] *Catostomus clarki* is very close to *C. arœopus*, differing chiefly in the larger size of the scales before the dorsal (23 in *clarki;* 42 in *arœopus*). Scales little crowded anteriorly. D. 11. Lat. l. 70.

[5] The type of *Catostomus guzmaniensis* is a *Pantosteus*, and on comparison I am unable to distinguish it from the type of *Pantosteus virescens*, Cope. The latter is said to be from Pueblo, Colo. The specimens of the former are much smaller than the type of the latter, but they are apparently adult, the fins being tuberculate. D. 10. Lat. l. nearly 100; 46 scales before dorsal. Lips with cartilaginous sheath; upper lip with many rows of tubercles. Eye small; fins high, the longest ray of dorsal 1$\frac{1}{5}$ in head. Head 4$\frac{1}{2}$ in length. No fontanelle.

[6] The type of *Catostomus generosus* seems to me unquestionably identical with the type of *Pantosteus platyrhynchus*, Cope, as well as with *P. jarrovii*, Cope. The peculiarities of *P. platyrhynchus* seem to be due to its shriveled condition.

[7] *Catostomus bernardini* is close to *C. occidentalis*, but the head in the former is less conic and the lower fins longer. Scales much crowded forwards, 75 in the lateral line, 31 before dorsal. D. 12; longer than high. Lips broad, without cartilaginous sheath; the lower, as in *C. occidentalis*, deeply incised. Fontanelle large. Caudal lobes equal.

[8] Lat. l. 73, in type of *Campostoma ornatum*.

[9] Lat. l. 46, in type of *C. formosulum*.

[10] *Campostoma nasutum* is an ordinary *C. anomalum*.

Name.	Identification.
* Dionda episcopa[1]	Dionda episcopa, (Grd.).
* Dionda serena[2]	Dionda serena, (Grd.).
* Dionda texensis[3]	Dionda episcopa, (Grd.).
Dionda papalis	? Dionda serena, (Grd.).
* Dionda argentosa[4]	Dionda episcopa, (Grd.).
† Dionda chrysitis[5]	Dionda serena, (Grd.).
† Dionda melanops[6]	Dionda melanops, (Grd.).
* Dionda couchi	? Dionda melanops, (Grd.).
Dionda plumbea	? Zophendum ? plumbeum, (Grd.).
Dionda spadicea	? Zophendum ? plumbeum, (Grd.).
Dionda grisea, (U. S. Pac. R. R.)	? Zophendum ? plumbeum, (Grd.).
* Hyborhynchus perspicuus	Pimephales notatus, (Raf.).
* Hyborhynchus tenellus	Pimephales notatus, (Raf.).
Hyborhynchus puniceus	? Zophendum ? plumbeum, (Grd.).
* Hyborhynchus confertus	Pimephales promelas confertus, (Grd.).
* Pimephales maculosus	Pimephales promelas confertus, (Grd.).
Pimephales fasciatus	Pimephales promelas, (Raf.).
* Algoma amara	Dionda amara, (Grd.).
Algoma fluviatilis	Dionda fluviatilis, (Grd.).
* Cochlognathus ornatus, (B. & G.)	Cochlognathus ornatus, (B. & G.).
* Hybognathus argyritis	Hybognathus argyritis, (Grd.).
Hybognathus evansi	? Hybognathus nuchalis, (Agass.).
* Hybognathus placitus	Hybognathus nuchalis placita, (Grd.).
* Algansea bicolor	Algansea bicolor, (Grd.).
* Algansea obesa	Algansea obesa, (Grd.).
* Algansea formosa[7]	Algansea symmetrica, (B. & G.).
* Lavinia exilicauda, (B. & G.)	Lavinia exilicauda, (B. & G.).
* Lavinia harengus	Lavinia exilicauda, (B. & G.).
* Argyreus dulcis	Rhinichthys cataractæ dulcis, (Grd.).
* Argyreus nubilus[8]	Agosia nubila, (Grd.).

[1] This species has been lately fairly described by Professor Cope, under the name of *Hybognathus flavipinnis*. The suborbital bones in this and other species of "*Dionda*" are rather broad, much as in *Hybognathus nuchalis*. Lat. l. 37.

[2] This species has been described under the name of *Hybognathus nigrotæniatus* Cope. It has larger scales than *D. episcopa*, and rather smaller eye. Lat. l. 34.

[3] This species seems to be identical with *D. episcopa*. Lat. l. 36 to 39.

[4] This species seems to be also identical with *D. episcopa*. Lat. l. 37.

[5] The types of *Dionda serena* and *D. chrysitis* much resemble each other, except that *D. serena* is much darker in color. *D. chrysitis* has scales 5–32–4. Head 4⅗ in length; depth 4½. Eye 3⅓ in head. Head shorter and body less deep than shown in Girard's figure. (MEEK.)

[6] *D. melanops* and *D. couchi* are little different. The former has scales 7–38–4; the latter 6–36–3. Both are deeper than the other *Dionda*; depth 3½ to 3⅘ in length. In *D. couchi* the lower jaw has a conspicuous dermal fold. This is little developed in *D. melanops* and obsolete in the other *Dionda*. The black caudal spot is much more distinct in *D. melanops* than in *D. couchi*. (MEEK.)

[7] The original type of *Pogonichthys symmetricus*, B. & G., has no barbel, and the teeth are 4–5. Lat. l. 53. Depth 4⅓ in length. It seems to be identical with *Algansea formosa*. The name *Algansea* should apparently supersede *Leucos* (preoccupied) and *Myloleucus*. *Algansea antica*, Cope (type examined by me) seems to be a valid species of this genus. The following notes may be added to Cope's description:

Head 3⅗ in length; depth 3⅖. Head acute, subconic; snout rather pointed, 4⅘ in head. Insertion of dorsal midway between pupil and base of caudal. Mouth small; jaws equal; maxillary 4 in head. Pectoral short, not nearly reaching ventral. Lateral line decurved. Scales 10–49–6. Teeth 4–5, little hooked, with very broad grinding surface.

[8] I am unable to separate *Apocope vulnerata*, *henshavii*, *rhinichthyoides*, or *coucsi* from *A. nubila*. *A. oscula*, Cope (not Grd.), is also the same, as is probably *Apocope carringtoni* also. The genus *Apocope* may apparently, without violence, be united to *Agosia*.

Name.	Identification.
* Argyreus osculus [1]	Agosia oscula, (Grd.).
Argyreus notabilis	Agosia oscula, (Grd.).
Agosia chrysogaster	Agosia chrysogaster, (Grd.).
Agosia metallica	Agosia metallica, (Grd.).
* Pogonichthys inæquilobus, (B. & G.)	Pogonichthys macrolepidotus, (Ayres).
* Pogonichthys symmetricus, (B. & G.)	Algansea symmetrica, (Grd.).
* Pognichthys argyreiosus, (B. & G.)[2]	Pogonichthys macrolepidotus, (Ayres).
* Pogonichthys communis	Platygobio gracilis, (Rich.).
* Gobio gelidus	Hybopsis gelidus, (Grd.).
* Gobio æstivalis [3]	Hybopsis æstivalis, (Grd.).
Gobio vernalis	Hybopsis amblops, (Raf.).
* Leucosomus dissimilis [4]	Couesius dissimilis, (Grd.).
* Leucosomus pallidus	Semotilus atromaculatus, (Mitch.).
* Leucosomus incrassatus	Semotilus atromaculatus, (Mitch.).
* Nocomis nebracensis	Hybopsis biguttatus, (Kirt.).
Exoglossum mirabile [5]	Phenacobius mirabilis, (Grd.).
Meda fulgida [6]	Meda fulgida, (Grd.).
Cliola vigilax, (B. & G.)[7]	Cliola vigilax, (B. & G.).
Cliola velox	Cliola vigilax, (B. & G.).
* Cliola vivax	Cliola vigilax, (B. & G.).
* Alburnus dilectus [8]	Notropis dilectus, (Grd.).
* Alburnus umbratilis [9]	Notropis umbratilis, (Grd.).
† Alburnus amabilis[10]	Notropis amabilis, (Grd.).

[1] The type of *Argyreus osculus* has about 90 scales in the lateral line, and is identical with *Apocope ventricosa.* The type of *A. notabilis* I cannot find, but the figure seems to be intended for *Agosia oscula.*

[2] The type of *Pogonichthys argyriosus* is the young of *P. macrolepidotus*, with the caudal lobe broken off. The genus "*Symmetrurus,*" based on this species, is therefore valueless.

[3] *Ceratichthys sterletus,* Cope, seems to be identical with *Gobio æstivalis;* the types have been compared by me.

[4] I now regard *Couesius milneri,* Jor., *Ceratichthys prosthemius,* Cope, and *Gobio plumbeus* as identical. *Couesius dissimilis* has the scales larger than in *C. plumbeus;* lat. l. 60; cross series 22, the lateral line much decurved; the mouth oblique, subterminal, much as in *Semotilus;* head flattish above; barbel small, terminal. Head 4 in length: depth 4; eye 4¼ in head.

[5] *Exoglossum mirabile,* Grd. = *Sarcidium scopiferum,* Cope = *Phenacobius teretulus* var. *liosternus,* Nelson.

[6] In the types of *Meda fulgida*, the teeth are 2, 4 or 5–5, 1 or 2. The genus is precisely identical with *Plagopterus,* Cope. *Meda fulgida* and *Meda argentissima* are, however, apparently distinct species, although closely related.

[7] *Cliola vigilax,* B. and G. = *Cliola velox,* Grd. = *Cliola vivax,* Grd. = *Hybopsis tuditanus,* Cope = *Alburnops taurocephalus,* Hay = *Hypargyrus tuditanus,* Forbes.

[8] *Alburnus dilectus,* Grd. = *Alburnus oligaspis,* Cope. The types of the latter, examined by me, have 11 anal rays.

[9] *Alburnus umbratilis,* Grd. = *Luxilus lucidus,* Grd = *Notropis nigripinnis,* Gilbert. The type of this species has 44 scales in the lateral line. *Notropis macrolepidotus,* Forbes, much resembles the young of this species, but is said to have rather larger scales. (6–40–3 instead of 9 or 10–44 or 45–4.)

[10] *Notropis amabilis* seems to be a valid species. The following additions may be made to the description as given in the Synopsis. Head less acute than in *N. rubrifrons.* Jaws equal; maxillary reaching front of eye; fins short; dusky blotch at base of caudal very faint. Head 4⅓ in length; depth 5. A. i. 8. Scales 5–34–3.

Name.	Identification.
† Alburnus megalops[1]	Notropis swaini, (Jor. & Gilb.).
* Alburnus socius[2]	Notropis socius, (Grd.).
* Alburnops blennius[3]	Notropis blennius, (Grd.).
Alburnops shumardi	Notropis sp.
* Alburnops illecebrosus[4]	Notropis illecebrosus, (Grd.).
* Codoma ornata	Notropis ornatus, (Grd.).
Codoma vittata	Notropis vittatus, (Grd.).
Plargyrus typicus	Notropis megalops, (Raf.).
Plargyrus bowmani	Notropis megalops, (Raf.).
Cyprinella bubalina, (B. & G.)	Notropis bubalinus, (B. & G.).
* Cyprinella umbrosa[5]	Notropis bubalinus, (B. & G.).
* Cyprinella gunnisoni[6]	Notropis bubalinus, (B. & G.).
† Cyprinella beckwithi[7]	Notropis bubalinus, (B. & G.).

[1] *Notropis swaini*, Jordan & Gilbert, nom. sp. nov. = *Alburnus megalops*, Grd. The name *megalops* is preoccupied in the genus *Notropis*; we therefore propose for this species the new name *Notropis swaini*. The following description is taken from specimens obtained by Professor Gilbert and the writer in the Rio Comal at New Braunfels, Tex. These have been compared with types of *Alburnus megalops* and *Alburnus socius* in the Philadelphia Academy:

Body moderately elongate, somewhat compressed, a little more robust than in *N. rubrifrons*; back a little elevated. Head rather short and broad, the interorbital space somewhat convex, its width about two-thirds that of the eye. Eye very large, $2\frac{3}{5}$ in head, about half longer than the rather obtuse snout. Mouth large, oblique, the lower jaw slightly projecting; the maxillary reaching nearly to front of pupil; its length $2\frac{4}{5}$ in head. Fins small; dorsal inserted somewhat behind ventrals. Lateral line decurved; scales large, 16 before dorsal.

Head $4\frac{1}{6}$ in length; depth $4\frac{1}{2}$. D. 9. A. 9. Scales 6–35–3. Teeth 2, 4–4, 2, hooked with little, if any, grinding surface.

Color greenish, the scales above dark edged; a plumbeous band along the sides, which does not form a distinct spot at base of caudal; dark dots along lateral line; a dark vertebral streak; fins pale.

This species is common in the outlet to the Comal Spring at New Braunfels. The largest specimens taken are a little over 2 inches in length. Some of these are numbered 36529 in the U. S. National Museum.

[2] A type of *Alburnus socius* in the museum of the Academy belongs to a species apparently different from *N. swaini* (*megalops*). *N. socius* is deeper, the depth being $4\frac{1}{3}$ in length; the head is 4 in body, the eye smaller, 3 in head. The head is rather deep and flattish above; maxillary extending to past front of eye; lower jaw longest. A. 10. Lat. l. 33. Color paler, the sides without dark dots.

[3] In one of the types of *Alburnops blennius* the teeth are 1, 4–4, 0. The snout is a little more convex than in *A. illecebrosus*. The anterior suborbital is in *A. blennius* rather broad, but in *A. illecebrosus* very narrow. Both species are brightly silvery. I am unable to identify *A. shumardi*, the types being lost.

[4] *Alburnops illecebrosus* type. (Phila. Acad.) Head $4\frac{1}{3}$; depth $4\frac{1}{4}$. D. 8. A. 9. Scales 6–36–3. Teeth 2, 4–4, 2, little hooked, with narrow grinding surface, and the edges of the first very slightly crenate. Thirteen scales before dorsal. Eye $3\frac{2}{3}$ in head. Snout rounded, $4\frac{1}{5}$ in head. Mouth oblique; upper lip on level of pupil. Maxillary $3\frac{3}{4}$ in head, reaching front of eye. Color pale, a very bright silvery band along sides, about as wide as eye. (MEEK.)

[5] The types of *Cyprinella umbrosa* have 32 to 35 scales in the lateral line. They are doubtless identical with the prior-named *bubalinus*.

[6] The types of *C. gunnisoni* seem to be the young of *N. bubalinus*. Lat. l. 34.

[7] *Cyprinella beckwithi* seems to be identical with *C. umbrosa*; the differences noticeable seem to be due to the small size of the specimen of *C. beckwithi* examined. Scales 7-34–4. (MEEK.)

Name.	Identification.
† Cyprinella suavis [1]	?Notropis lutrensis.
Cyprinella lepida	Notropis sp.
Cyprinella notata [2]	Notropis notatus, (Grd.).
* Cyprinella whipplei [3]	Notropis whipplei, (Grd.).
* Cyprinella macrostoma [4]	Notropis macrostomus, (Grd.).
† Cyprinella venusta [5]	Notropis venustus, (Grd.).
* Cyprinella texana [6]	?Notropis notatus, (Grd.).
Cyprinella luxiloides	?Notropis macrostomus, (Grd.).
Cyprinella lugubris	?Notropis macrostomus, (Grd.).
† Cyprinella ludibunda [7]	Notropis ludibundus, (Grd.).
* Moniana lutrensis,[8] (B. & G.)	Notropis lutrensis, (B. & G.).
Moniana leonina	Notropis leoninus, (Grd.).

[1] Two very small specimens of *Cyprinella suavis* are in the museum of the Academy. Head 4¼ in length; depth 3½; eye 4 in head; snout rather pointed; maxillary scarcely reaching eye; 4 in head. Body elliptical, rather deep. D. 8. A. 9. Scales 5–32–3; 15 before dorsal. (MEEK.) This description indicates *Notropis lutrensis.*

[2] The specimens which we suppose to be types of *Cyprinella notata* consist of one *Notropis lutrensis* and two of another species, closely allied to *N. cercostigma*, but with larger scales (lat. l. 34) and faint caudal spot. The latter species may retain the name of *Notropis notatus.*

[3] *Cyprinella whipplei*, Girard, 1856 = *Cyprinella analostana*, Girard, 1859.

[4] *Cyprinella macrostoma* is apparently a valid species. The description in the Synopsis is from the type.

[5] Two types of *Cyprinella venusta* (140 S. I.; Rio Sabinal) are in the museum of the Academy. These have head 4 in length; depth 3¾; scales 5–31–3; 15 before dorsal. Teeth 4–4. Eye 3⅗ in head; snout 4. D. 7. A. 8. Maxillary reaching front of eye, 3¾ in head. Mouth very oblique; jaws subequal. Scales larger than in most related species. Brownish above, with a silvery reflection along sides. A round black spot at base of caudal as large as eye.

This species is distinct from *C. texana.* The eye is smaller, the mouth more oblique, and the snout more pointed in *C. venusta* than in *C. texana.* The caudal spot is much more distinct in the former than in the latter. (MEEK.)

From the above description it would appear that this species is distinct from the common *Notropis cercostigma* (= *Luxilus chickasavensis*, Hay = *Cliola urostigma*, Jordan & Meek), with which species I had recently identified Girard's description. *N. stigmaturus*, Jordan = *Cyprinella calliura*, Jordan, is very close to *N. cercostigma*, differing chiefly in the smaller scales (44 instead of 38).

[6] One specimen of *Cyprinella texana* (128 S. 1., from Rio Salado) is in the museum of the Academy.

Head 4; depth 3¾. D. 7, A. 8. Scales 5–35–3. Teeth 4–4. Eye 3 in head; snout 3¼; 15 scales before dorsal. Mouth small, little oblique; the snout blunt, projecting. Maxillary 3¾ in head, not quite reaching front of orbit. Mouth more inferior than is shown in Girard's figure; the snout more blunt. Caudal spot faint. (MEEK.)

This species is perhaps identical with *N. notatus.* It can hardly be the young of *N. cercostigma.*

[7] One specimen of *Cyprinella ludibunda*, 1½ inches long (S. I., 132, from Cottonwood Creek), is in the museum of the Academy.

Head 4; depth 4¾. Eye 3 in head; snout 4. D. 8, A. 7. Scales 4–31–3; 13 before dorsal. Mouth oblique; maxillary 3¾ in head, its tip reaching front of eye. First rays of dorsal reaching beyond last when depressed. Scales dusky above.

[8] *Moniana lutrensis*, B. & G. = *Moniana pulchella*, Grd. = *Moniana gracilis*, Grd. = ? *Moniana lætabilis*, Grd. = *Moniana couchi*, Grd. = ? *Cyprinella suavis*, Grd. = *Moniana gibbosa*, Grd. = *Moniana jugalis*, Cope = *Hypsilepis iris*, Cope = *Cyprinella billingsiana*, Cope = *Cyprinella forbesi*, Jor.

Name.	Identification.
* Moniana deliciosa[1]	Notropis deliciosus, (Grd.).
* Moniana proserpina[2]	Notropis proserpina, (Grd.).
* Moniana aurata[3]	Notropis proserpina, (Grd.).
Moniana complanata	Notropis leoninus, (Grd.).
† Moniana lætabilis[4]	Notropis lutrensis, (B. & G.).
* Moniana pulchella[5]	Notropis lutrensis, (B. & G.).
* Moniana frigida[6]	Notropis leoninus, (Grd.).
† Moniana couchi[7]	Notropis lutrensis, (B. & G.).
† Moniana rutila[7]	Notropis lutrensis, (B. & G.).
* Moniana nitida[8]	Notropis nitidus, (Grd.).
† Moniana formosa[9]	Notropis formosus, (Grd.).
* Moniana gracilis[7]	Notropis lutrensis, (B. & G.).

[1] *Moniana deliciosa*, Grd., seems to be identical with *Hybopsis missuriensis*, Cope. *Notropis stramineus*, Cope, seems to be a variety of the same species, with the scales slightly larger, on an average. *Hybopsis longiceps*, Cope, and *H. volucella*, Cope, are but slightly different, and are all probably varieties of *N. deliciosus*.

[2] One of the types of *Moniana proserpina* (117 S. I., Devil's River, Texas) is in the museum of the Academy.

Length 2 inches. Head 3¾; depth 4. D. 7., A. 7. Fourteen scales before dorsal. Scales 6–35–3. Eye 4 in head; snout blunt, 3⅓ in head; mouth subinferior, nearly horizontal; upper on level of lower edge of orbit. Top of head rather convex, with a slight median crest. Body rather robust; the ventral outline nearly straight; the back elevated. Color brownish above, rather silvery on sides and below, but with no evident silvery lateral band. A blackish metallic band made up of dark punctulations running from upper edge of preopercle to upper edge of base of caudal.

This is identical with the type of *Moniana aurata* (118 S. I., from Piedrapainte, N. Mex.). (MEEK.)

[3] The specimens of *Moniana aurata* are tuberculate males, apparently of the same species as the types of *Moniana proserpina*. Compared with *N. lutrensis*, *N. proserpina* has the mouth smaller and more inferior, the snout and head heavier and more obtuse, and the body rather less deep. The males show a dusky humeral bar, as in *M. lutrensis*, and a faint, dusky, horizontal stripe.

[4] *Moniana lætabilis* (S. I., 120, Hurrah Creek, 1¾ inches long) seems to be indistinguishable from the young of *N. lutrensis*. Head 4 in length; depth 3⅗. Scales 6–35–3; sixteen scales before dorsal. Eye 3½ in head. Mouth very oblique; maxillary reaching front of eye. (MEEK).

[5] *Moniana pulchella*, Grd., is unquestionably identical with *N. lutrensis*. We have compared the types with those of the latter, and with the types of *M. jugalis*, Cope, as well as with numerous specimens collected by Jordan & Gilbert in the streams about Fort Smith.

[6] The types of *Moniana frigida* differ from *N. lutrensis* chiefly in the larger number of scales (37) in the lateral line. The body is also rather more elongate than usual in *N. lutrensis*. I think that *leonina* and *complanata* will be found to be identical with *M. frigida*, but I am unable to find the types of either.

[7] The types of *Moniana couchi*, *rutila*, and *gracilis* are all small fishes, mostly in poor condition. They are indistinguishable from the young of *lutrensis*. (MEEK.) Specimens of *gracilis* are also in the National Museum. They seem a little slenderer than the average *lutrensis*, but probably all belong to that species.

[8] *Moniana nitida* seems to be a valid species allied to *Notropis deliciosus*. A description will be given elsewhere.

[9] *Moniana formosa* (114 S. I., Rio Mimbres) seems to be distinct from all of the other species. Head 3¾; depth 3½. D. 8. A. 8. Scales 7–43–4; 23 scales before dorsal.

Name.	Identification.
Moniana gibbosa	Notropis lutrensis, (B. & G.).
Moniana tristis	Notropis sp.
* Richardsonius lateralis	Richardsonius lateralis, (Grd.).
* Luxilus occidentalis, (B. & G.)[1]	Luxilinus occidentalis, (B. & G.).
* Luxilus leptosomus [2]	Notemigonus chrysoleucus.
Luxilus seco [3]	Notemigonus ? chrysoleucus.
† Luxilus lucidus [4]	Notropis umbratilis, (Grd.).
* Semotilus macrocephalus	Semotilus atromaculatus, (Mitch.).
* Semotilus speciosus	Semotilus atromaculatus, (Mitch.).
† Tiaroga cobitis [5]	Tiaroga cobitis, (Grd.).
Gila (species)[6]	Gila (species).
Tigoma (species) [6]	Squalius (species).
Cheonda (species)[6]	Squalius (species).

Eye 3½ in head, slightly longer than snout. Snout formed as in *N. lutrensis;* the mouth oblique. Maxillary 3½ in head, reaching past front of orbit. Form fairly represented in Girard's figure, but the caudal peduncle rather more attenuate.

Some blackish dots along the posterior margin of each scale; a dusky band mixed with silvery along sides. A brownish spot as large as pupil on base of caudal. Teeth 4–4.

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[1] *Luxilinus*, Jordan; type *Luxilinus occidentalis*, B. & G. This genus is allied to *Notemigonus*, differing in having the belly nowhere carinated, the ventral line behind ventral fins being covered with ordinary imbricated scales. Teeth 5–5, with entire edges and strong grinding surface. Gill-rakers slender, of moderate length. Intestine short, but more elongate than in *Notropis.*

[2] The type of *Luxilus leptosomus* is in bad condition. It is not evidently different from *Notemigonus chrysoleucus.*

[3] The type of *Luxilus seco* (in the Academy at Philadelphia) is a young *Notemigonus* not evidently different from *N. chrysoleucus.* It has A. 13 or 14; lat. l. 55; teeth 5–5 mouth very small; lateral line decurved; a dusky spot at base of caudal.

[4] Two specimens (56 S. I., 3½ inches long) of *Luxilus lucidus*, Girard, are in the museum of the Academy. Head 4; depth 3¾. D. 8; A. 11. Scales 7–40–3; 25 scales before dorsal. Teeth 2, 4–4, 2, with oblique grinding surface. Ventral line covered with scales. Eye = snout, 3⅗ in head. Insertion of dorsal midway between base of caudal, a point just behind tip of snout. Lateral line decurved. Scales before dorsal much crowded. Mouth oblique, the maxillary reaching front of orbit, 3⅓ in head. Base of anal 1½ in head. (MEEK.)

This species is apparently identical with *Notropis umbratilis*, described from the same region.

[5] A type of *Tiaroga cobitis*, in the Philadelphia Academy, has been examined by me. The genus is evidently a valid one, and very distinct from *Notropis*, approaching most nearly to *Rhinichthys*. The following are my notes on the specimen examined:

Body decidedly elongate, loach-like, subfusiform, little compressed, covered with minute scales. Head small, subconical, depressed. Mouth very small, terminal, oblique, without barbels, the maxillary 4 in head, not reaching nearly to eye. Premaxillary not protractile. Lips fleshy. Lower jaw included. Eye moderate, placed high, nearly midway in head, its length 3¾ in head. Isthmus very wide. Ventrals slightly in advance of dorsal. Fins all high, the first (rudimentary) ray of dorsal somewhat enlarged. Pectorals reaching ventrals; ventrals past front of anal. Head 4¾ in length: depth 6. D. 8, A. 7. Lat. l. 60 to 70 (not to be counted exactly). Teeth apparently 1, 4–4, 1, extremely small, apparently without grinding surface.

[6] I here omit all reference to the species of *Gila*, "*Tigoma*," and "*Cheonda*," not having yet re-examined Girard's types, and having therefore nothing to add to the account given in the Synopsis.

Name.	Identification.
* Siboma crassicauda, (B. & G.)[1]	Squalius crassicauda, (B. & G.).
Siboma atraria[2]	Squalius atrarius, (Grd.).
* Ptychocheilus rapax[3]	Ptychochilus rapax, (Grd.).
* Ptychocheilus lucius	Ptychochilus lucius, (Grd.).
* Ptychocheilus vorax	Gila grahami, (B. & G.).
Hybognathus regius	Hybognathus nuchalis regia, (Grd.).
* Hudsonius fluviatilis[4]	Notropis hudsonius, (Clinton).
Hudsonius amarus[5]	Notropis hudsonius amarus, (Grd.).
Hybopsis winchelli	Hybopsis amblops, (Raf.).
Clinostomus funduloides	Squalius funduloides, (Grd.).
Clinostomus affinis	Squalius vandoisulus, (C. & V.).
Clinostomus carolinus	? Squalius vandoisulus, (C. & V.).
Alburnus lepidulus	Notropis sp.
Plargyrus argentatus	Notropis megalops, (Raf.).
Ceratichthys leptocephalus	Hybopsis sp.
Nocomis bellicus	Hybopsis biguttatus, (Kirt.).

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[1] This is *Leuciscus gibbosus*, Ayres, as stated in the Synopsis, p. 240. The name *Leuciscus gibbosus* is, however, preoccupied by Storer, 1845. The appropriate specific name *crassicauda* should therefore be restored.

[2] It is probable that *Tigoma squamata*, Gill, and *Squalius rhomaleus*, Jordan & Gilbert, are both based on specimens of *Siboma atraria*, Girard.

[3] The only tangible character by which I can separate the type of *Ptychochilus rapax* from the ordinary *Pt. oregonensis* is this: the scales before the dorsal fin in *rapax* are much smaller than in *oregonensis*, there being about 49 scales in the former and 42 in the latter on the median line before the dorsal.

[4] The specimen from Lake Superior described by me (Bull. U. S. Nat. Mus., X., 60, 1877) as *Luxilus selene*, is identical with the types of *Hudsonius fluviatilis*.

[5] The only character by which I can separate *N. amarus* from *N. hudsonius* is the number of the teeth, 1, 4–4, 0, or 1 in *amarus;* 2, 4–4, 1 in *hudsonius*. All specimens examined from Pennsylvania, New York, and the Great Lakes are *hudsonius;* those from Virginia to Georgia seem to be *amarus*. I cannot distinguish from *amarus* either the types of *Alburnops saludanus*, Jordan & Brayton, or those of *Hudsonius euryopa*, Bean *Hybopsis storerianus*, confounded with *N. amarus* by several writers, is a different fish, belonging to another genus (= *Ceratichthys lucens*, Jordan).

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